

**FINAL Meeting Notes**  
**Lewis River License Implementation**  
**Terrestrial Coordination Committee (TCC) Meeting**  
**January 9, 2008**  
**CONFERENCE CALL**

**TCC Participants Present: (12)**

Brock Applegate, WDFW  
 Kendel Emmerson, PacifiCorp Energy  
 Diana Gritten-MacDonald, Cowlitz PUD  
 Eric Holman, WDFW  
 Mike Iyall, Cowlitz Indian Tribe  
 Curt Leigh, WDFW  
 Kimberly McCune, PacifiCorp Energy  
 Bob Nelson, RMEF  
 Todd Olson, PacifiCorp Energy  
 Kirk Naylor, PacifiCorp Energy  
 Mitch Wainwright, USDA Forest Service  
 Cherie Kearney, Columbia Land Trust (10:00am – 10:30am)

**Calendar:**

February 13, 2008	TCC Meeting	Merwin Hydro Facility
February 14, 2008	ACC Meeting	Merwin Hydro Facility

<b>Assignments from January 9th Meeting:</b>	<b>Status</b>
Naylor/Emmerson: Incorporate the following into the Forest Management chapter: WHMP lands that are within the SOSEA should have greater spotted owl protection than what is provided in Forest Practices Act and timber management actions should increase or improve spotted owl habitat in the SOSEA.	
McCune: Publish the Draft SMP on the Lewis River website and notify the TCC when available for viewing.	Complete – 1/10/08

<b>Assignments from December 12th Meeting:</b>	<b>Status</b>
McCune: Email the TCC 10/10/07 final meeting notes to Brock Applegate to confirm WDFW requested changes are in the final version.	Complete – 12/13/07
Emmerson: Review past TCC meeting notes to find how the TCC came to the spotted owl habitat objectives by January 9, 2008 meeting.	Complete – 1/9/08
Emmerson: Bring two Appendix X-1 tables to January 9, 2008 meeting. One with vegetation cover types and one without.	Complete – 1/7/08
Naylor: Provide PacifiCorp ownership and vegetation cover type maps within the SOSEA at January 9, 2008 meeting.	Complete – 2/13/08
Applegate: Verify the estimated effort for Broadcast Acoustical Survey for Northern Goshawks with WDFW colleges by January 9, 2008.	Complete – 2/13/08 (includes survey time only, not inclusive of travel time, etc.)

Applegate: Provide additional data relating to an open water to cover ratio of 25:75, as recommended by WDFW in edits to the first paragraph, page 10 of the Wetland WHMP chapter.	Pending
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Assignments from September 12, 2007 Meeting:	Status
Naylor/Emmerson: Incorporate the following text into the Forest Management chapter of the WHMP, " <i>Prior to any harvest, the areas will be evaluated (ground truth) to determine whether or not the area qualifies as NSO habitat.</i> "	In process
McCune: Email Attachment C, Management Alternatives relating to HEP assumptions to the TCC for their review.	Complete – 9/14/07
Emmerson: Revise the NSO memorandum, distribute to the TCC and request final approval at the October 10, 2007 TCC meeting.	Complete – 9/20/07

Parking lot items from February 10, 2006 Meeting:	Status
PacifiCorp Wildlife Habitat Management Plan (WHMP) Budget (annual)	
Conservation Agreement – what is wanted?	Ongoing – 4/28/06

### Review of Agenda

Kirk Naylor (PacifiCorp Energy) called the meeting to order at 9:00am. Naylor conducted a review of the agenda for the day and requested if the TCC had any additions to the agenda. No additions were requested.

### Finalize Meeting Notes

Naylor reviewed the TCC Draft 12/12/07 meeting notes with the TCC attendees and asked for any comments and/or additional changes.

The meeting notes were approved with no changes at 9:05am.

### Review of 12/12/07 WHMP Assignments

Assignments from December 12th Meeting:	Status
Emmerson: Review past TCC meeting notes to find how the TCC came to the spotted owl habitat objectives by January 9, 2008 meeting.	Complete – 1/9/08

Kendel Emmerson (PacifiCorp Energy) reviewed the above-referenced assignment with the TCC attendees in order to capture the intent of the TCC when establishing Objective j relating to spotted owl discussions. Emmerson identified text in the 3/20/06 meeting notes that indicated the following:

*The TCC agreed that a meeting of a spotted owl subgroup would be the most productive method to achieve the goal, and to include Joe Hiss from USFWS.*

*The subgroup will include:*

*Kirk Naylor (PacifiCorp)  
Brock Applegate (WDFW)  
Mitch Wainwright (USFS)  
Joe Hiss (USFWS)*

*LouEllyn Jones (USFWS)  
Eric Holman, tentative (WDFW)  
Diana Gritten-MacDonald (Cowlitz PUD)*

*The invitees may choose to invite additional subject matter experts.*

*The subgroup agreed that the following dates are open for a meeting at the Merwin Hydro Facility from approximately 9:00am – 3:00pm:*

*April 5, 17 & 18<sup>th</sup>, 2006*

Emmerson explained that she was unable to find meeting notes from this subgroup meeting or confirmation that the meeting was conducted. Several TCC members confirmed that meeting was not conducted.

In addition, Emmerson informed the TCC attendees that some discussion took place at the 5/30/06 TCC meeting, as notes regarding the addition of the following Objective j language:

*Objective j: Manage WHMP lands within the SOSEA under Forest Practices, especially WAC 222-16-080 and 222-10-041.*

In accordance with the meeting notes it appears the Objective j language was accepted as written with no objection.

Naylor requested the TCC attendees provide further detail as to concerns given there is a USFWS BiOp and an objective addressing the spotted owl.

Eric Holman (WDFW) expressed that perhaps PacifiCorp can do some thinning and create a better owl habitat and that it would be nice to add further clarification in the appropriate chapters associated with SOSEA.

Naylor communicated to the TCC attendees that it would be best to wait until he develops some of the management plans within the SOSEA and address the specifics at that time. The types of enhancements suggested could be best addressed site specifically within each management unit based on the existing diversity (age classes, cover types etc.) and slope of the site.

<b>Assignments from December 12th Meeting:</b>	<b>Status</b>
Emmerson: Bring two Raptor Appendix X-1 tables to January 9, 2008 meeting. One with vegetation cover types and one without.	<b>Complete – 1/7/08</b>

Kendel Emmerson (PacifiCorp Energy) reviewed the above-referenced assignment with the TCC attendees to include one appendix with vegetation cover types and the other appendix is without (**Attachment A**). The tables are intended to be used as a guideline if an active nest of one of the species listed in the table is located. This table will provide the habitat threshold, disturbance distance threshold, and limited operating periods for protecting that nest

1. General discussion took place regarding the removal of the vegetation cover types in the table. The TCC agreed that the table is more user-friendly with the vegetation cover types removed. Applegate (WDFW) felt that leaving the cover types would act as a “trigger” to look for those species or conduct the correct species survey(s) in that cover type. Applegate did not object to the removal of the cover type because the PacifiCorp now intends the table to act as information for buffers distances, if PacifiCorp found a nest.

Emmerson will make the requested edits and incorporate the revised table into the raptor chapter of the WHMP.

### **Shoreline Management Plan (SMP) Update**

Olson informed the TCC attendees that the initial draft of the SMP has been completed which includes the three classifications discussed at the 12/12/07 meeting:

- Resource Management
- Integrated Use
- Project Works

Olson informed the TCC that the North side of Swift reservoir contains edits to reflect information from Skamania County County’s new zoning. The North side of Swift is now considered integrated use. In addition, the South side of Swift is now considered resource management.

The Initial Working Draft Shoreline Management Plan – January 2008 and revised shoreline classification maps can be located on the Lewis River website at: <http://www.pacificorp.com/Article/Article76278.html>. Kimberly McCune (PacifiCorp Energy) will notify the TCC when the Draft SMP is available for viewing.

Olson expressed that changes were also incorporated based on comments received from agencies, i.e. Riprap will be changed to biotechnical solution. Best management practices, vegetation approval and pruning are also addressed as FERC wants this level of control on all shoreline lands.

Olson informed the TCC attendees that PacifiCorp has mailed the public meeting invite (**Attachment B**) to 365 residents in the Lewis River area, an ad will be in the February issue of three local newspapers and 400 notices will be included in the Woodland Chamber of Commerce February newsletter. The public meeting will take place on **Wednesday, February 6, 2008** at the Lewis River Golf Course.

PacifiCorp and Kleinschmidt Energy & Water Resource Consultants are soliciting public input to the Initial Working Draft SMP at the February 6<sup>th</sup> meeting. Following consideration of comments, a Public Review Draft SMP will be sent out for a formal public 30-day review period.

Curt Leigh (WDFW) expressed that the Plan should be clear when addressing those areas on the Swift North shoreline that have steep slopes, allowable uses will not be permitted. It is important to remove any misunderstanding relating to dock approval when clearly a dock will not be approved due to topography along certain areas of the Swift North shoreline. As such, Leigh

further expressed that the North shoreline blue integrated section illustrated on the Swift draft shoreline classification map is too steep and should be identified as resource management lands.

Holman would like further clarification in the allowable uses relating to where riprap is permitted vs. where biotechnique is a preferred method. Holman clearly expressed that he does not want to allow riprap in any area even integrated areas.

Olson expressed that Table 5.1, Allowed Uses by Shoreline Classification (**Attachment C**) and Best Management Practices listed in the Plan were created to encourage the use of native vegetation for a natural shoreline. Olson also communicated that considerable management will have to be provided relating to the review and issuance of shoreline permits. Additional resources may be needed to implement the permitting process.

### **Mink Riparian Area HEP Review and Discussion**

<b>Assignments from November 14th Meeting:</b>	<b>Status</b>
Emmerson: To provide documentation (e.g. maps or memo) demonstrating how the mink HSI model 100m cover variable will be determined using vegetation cover types.	<b>Complete 12/31/07</b>

Emmerson reviewed the above-referenced assignment with the TCC attendees titled, “*Percent Canopy Cover of Trees and Shrubs within 100 meters of Frasier Creek and Speelyai Creek*” (**Attachment D**) to include Mink habitat data collected by EDAW, a consultant to PacifiCorp. Emmerson provided a brief overview of the vegetation cover type, acres in 100m buffer, average percent cover and the weight Mink tree/shrub value.

Brock Applegate (WDFW) requested Emmerson modify the HSI value for sum total at the bottom of each table to read, “SIV5 Value for Sum Total of Weighted Mink Tree/Shrub Cover Value”.

The TCC attendees expressed that the information was very helpful and after the minor edits they did not need to see another draft.

### **Lands Update Discussion**

Cherie Kearney (Columbia Land Trust) and Kirk Naylor (PacifiCorp Energy) provided updates relating to interests in certain lands, however, this discussion is considered confidential and proprietary and not for public viewing.

### **Next Meeting’s Agenda**

- Lands Update Discussion
- Review of 1/9/08 Meeting Notes
- SOSEA Habitat Agenda
- SMP Update

### **Public Comment Opportunity**

No public comment was provided.

Meeting adjourned at 10:45am.

### Next Scheduled Meetings

<b>February 13, 2008</b>	<b>March 12, 2008</b>
Merwin Hydro Facility	USFWS
Ariel, WA	Lacey, WA
9:00am – 3:00pm	9:00am – 3:00pm

### Handouts

1. Agenda
2. Draft meeting notes from 12/12/07
3. Vegetation Cover Types that Provide Suitable Nesting Habitat for Potentially Breeding Raptors on WHMP Lands, **Attachment A**
4. Lewis River Public Meeting – Shoreline Management Plan, dated January 7, 2008, **Attachment B**
5. Table 5.1, Allowed Uses by Shoreline Classification, **Attachment C**
6. Percent Canopy Cover of Trees and Shrubs within 100 meters of Frasier Creek and Speelyai Creek, **Attachment D**

Habitat Thresholds, Vegetation Cover Types, Limiting Operating Periods, and Disturbance Thresholds for Potentially Breeding Raptors on WHMP Lands

Species	Habitat	Vegetation Cover Types that Provide Suitable Nesting Habitat for Potentially Breeding Raptors on WHMP Lands <sup>1</sup>																												Habitat Threshold	Limited Operating Periods	Disturbance Distance Threshold <sup>2</sup>								
		Lacustrine & Riverine				Wetland					Conifer Forests						Upland Deciduous Forests			Mixed Conifer/Deciduous Forests		Riparian					Non-Forests						Developed and Disturbed							
		RUB	RUS	LUB	LUS	PUB	PAB	PEM	PSS	PSS/PEM	PFO	SSI	SS	P	MS	M	OG	LP	YUD	UD	OW	YUM	UM	RS	RD	YRM	RM	RG	MD				PA	RO	RT	SH	AG	DV	REC	ROW
<b>American kestrel</b> <i>(Falco sparverius)</i>	Open to semi-open habitats <sup>3</sup> . Nest in cavities in large trees, as well as cut banks and cliffs <sup>4</sup>											X															X	X	X					X	X	X	X	660 ft (201 m)	April 15 to August 1 <sup>6</sup>	660 ft (201 m)
<b>Bald eagle</b> <i>(Haliaeetus leucocephalus)</i>	Associated with large bodies of water that support ample prey <sup>3</sup> . Nest is large prominent trees average between 42 to 67 in (107 to 170 cm) dbh <sup>4</sup> .	X	X	X	X									X	X	X																					Primary zone within 400 ft (120 m) of nest tree Secondary zone 400 to 800 ft (12 to 240m) of nest tree <sup>7</sup>	Nesting Jan 1 to Aug 31 Key Winter Period Nov 15 to Mar 31 <sup>8</sup>	1320 ft (400 m) or 2640 ft (800 m) line-of-sight	
<b>Barn owl</b> <i>(Tyto alba)</i>	Open to semi-open habitats: grasslands, meadows, clear-cuts, marshes, agricultural fields, and urban areas <sup>3</sup> . Breeds in open buildings, nest boxes, and cut banks near open lands											X																X	X					X	X	X	X	660 ft (201 m)	April 1 to September 15 <sup>9</sup>	660 ft (201 m)
<b>Barred owl</b> <i>(Strix varia)</i>	Conifer to mixed-conifer deciduous forests <sup>4</sup> . Nest in cavities, tops of snags, and abandon raptor or corvid stick nests. <sup>3</sup>												X	X	X	X	X		X		X			X													660 ft (201 m)	March 1 to August 30	660 ft (201 m)	
<b>Cooper's hawk</b> <i>(Accipiter cooperii)</i>	Coniferous, mixed-coniferous, and deciduous forests. Mature forests with widely spaced trees <sup>4</sup>												X	X	X		X		X		X		X													660 ft (201 m)	April 1 to August 15 <sup>9</sup>	660 ft (201 m)		
<b>Golden Eagle</b> <i>(Aquila chrysaetos)</i>	Associated with open areas. Nests generally on cliffs and occasionally in trees. More common east of the Cascades, but golden eagles have been found in mature and old-growth forests near the edges of clearcuts and other open areas in western Washington. <sup>14</sup>													X	X																					980 ft (300 m) <sup>14</sup>	February 15 to July <sup>14</sup>	980 ft (300 m) <sup>14</sup>		
<b>Great-horned owl</b> <i>(Bubo virginianus)</i>	All forest types, agricultural areas, and urban areas. Nest in platforms or tree cavities, or cliff ledges. May use stick nests built by hawks, eagles, and ravens <sup>4</sup>												X	X	X	X	X		X	X		X		X	X	X	X	X	X		X	X	X	X	660 ft (201 m)	February 1 to July 31 <sup>9</sup>	660 ft (201 m)			
<b>Merlin</b> <i>(Falco columbarius)</i>	Prefer open to semi-open habitats. In western Washington often found near estuaries, lakes, reservoirs because the areas provide breaks in the forest. Nest in old raven, hawk nest, or tree cavities, or cliff ledges. <sup>4</sup>	X	X	X	X	X								X	X	X								X												660 ft (201 m)	April 15 to August 1	660 ft (201 m)		
<b>Northern goshawk</b> <i>(Accipiter gentilis)</i>	Home range consists of varied amount of forest age classes and conditions. Nest in coniferous trees in mature or old-growth stands that are greater than 20 acres in size. Stands include large trees, > 50% canopy closure, multi-layered canopy, gaps in the canopy, abundance of large diameter crowns, and the presence of shade tolerant trees. <sup>10</sup>												X	X	X	X	X		X		X		X													Post-fledgling Area (PFA) equal to 420 ac (170 ha) centered around a nest or a 2415 ft (736 m) radius around a nest tree <sup>10</sup>	March 1 to September 30 <sup>10</sup>	2640 ft (800 m) from nest tree <sup>10</sup>		
<b>Northern harrier</b> <i>(Circus cyaneus)</i>	Open to semi-open habitats grasslands, meadows, marshes, and agricultural fields. Nest on the ground in patches of tall dense vegetation. <sup>4</sup>					X	X	X	X	X														X	X	X			X							660 ft (201 m)	March 21 to September 15 <sup>3</sup>	660 ft (201 m)		
<b>Northern pygmy-owl</b> <i>(Glaucidium gnoma)</i>	Coniferous and mixed coniferous forests. <sup>3</sup> Secondary cavity nester using woodpecker and flicker holes or natural cavities. <sup>4</sup>												X	X	X	X		X		X		X		X												660 ft (201 m)	April 1 to July 15 <sup>4</sup>	660 ft (201 m)		
<b>Northern Saw-whet owl</b> <i>(Aegolius acadicus)</i>	Coniferous and riparian forests. Secondary cavity nester using woodpecker and flicker holes or natural cavities. <sup>4</sup>												X	X	X								X		X											660 ft (201 m)	April 1 to July 15 <sup>4</sup>	660 ft (201 m)		

Habitat Thresholds, Vegetation Cover Types, Limiting Operating Periods, and Disturbance Thresholds for Potentially Breeding Raptors on WHMP Lands

Species	Habitat	Vegetation Cover Types that Provide Suitable Nesting Habitat for Potentially Breeding Raptors on WHMP Lands <sup>1</sup>																													Habitat Threshold	Limited Operating Periods	Disturbance Distance Threshold <sup>2</sup>								
		Lacustrine & Riverine				Wetland					Conifer Forests						Upland Deciduous Forests			Mixed Conifer/Deciduous Forests		Riparian					Non-Forests							Developed and Disturbed							
		RUB	RUS	LUB	LUS	PUB	PAB	PEM	PSS	PSS/PEM	PFO	SSI	SS	P	MS	M	OG	LP	YUD	UD	OW	YUM	UM	RS	RD	YRM	RM	RG	MD	PA				RO	RT	SH	AG	DV	REC	ROW	
<b>Northern spotted owl</b> ( <i>Strix occidentalis</i> )	Stands at least 16 in. (41 cm) average dbh with at least 4 trees per acre (10 trees per ha) that are ≥ 30 in. (76 cm) dbh or larger, Numerous large snags (typically > 2/ ac [5/ha]), numerous down logs (typically >15 tons/ac [33.6 metric tons/ha]), multi-layered canopy, greater than 40% canopy (typically >60%) <sup>8</sup>																																						500 acres (202 ha) and 2,663 acres (1,078 ha) within 0.7-mile (1.1-km) and 1.82-mile radius (2.9 km), respectively, of an active northern spotted owl home range <sup>8</sup>	March 1 to August 31. Critical nesting period March 1 to June 30 <sup>11</sup>	360 ft (110 m) <sup>8</sup>
<b>Osprey</b> ( <i>Pandion haliaetus</i> )	Associated with bodies of water that support ample fish. Nest in large trees with broken tops or snags. <sup>4</sup>	X	X	X	X	X																																660 ft (201 m) <sup>13</sup>	April 1 to September 30 <sup>10</sup>	660 ft (201 m) <sup>13</sup>	
<b>Peregrine falcon</b> ( <i>Falco peregrinus</i> )	Nest on cliff ledges ranging from 75 to 2000 feet (23 to 610 m) in height and within ¼ to ½ mile (0.40 to 0.80 km) of riparian or lacustrine habitat <sup>12</sup>																																					0.5 mi. (0.80 km) between March 1 and July 31 and 0.25 mi. (0.40 km) August 1 to February 28 <sup>12</sup>	March 1 to July 31 <sup>13</sup>	0.5 mi. (0.80 km) between March 1 and July 31 and 0.25 mi. (0.40 km) August 1 to February 28 <sup>12</sup>	
<b>Red-tailed hawk</b> ( <i>Buteo jamaicensis</i> )	Open to semi-open habitats, but will use woodlands. Constructs stick nests in tall trees and utility poles <sup>4</sup> .											X	X		X	X	X	X		X				X		X	X	X	X					X	X	X	X	660 ft (201 m)	March 1 to September 15 <sup>3</sup>	660 ft (201 m)	
<b>Sharp-shinned hawk</b> ( <i>Accipiter striatus</i> )	Associated with coniferous forests, mixed coniferous deciduous forests, and riparian woodlands. Nest are built on a limb or in the fork of a limb <sup>3</sup>													X	X	X	X		X				X		X												660 ft (201 m)	April 15 to August 31 <sup>4</sup>	660 ft (201 m)		
<b>Western screech-owl</b> ( <i>Otus kennicotti</i> )	Forest edges and riparian woodlands, especially those with older deciduous trees, adjacent to open pastures or fields. <sup>4</sup> Secondary cavity nester using woodpecker and flicker holes or natural cavities. Requires trees that ≥ to 12 inches (30 centimeters) in dbh <sup>3</sup>													X	X	X	X		X				X		X												660 ft (201 m)	April 15 to August 31 <sup>4,9</sup>	660 ft (201 m)		

<sup>1</sup>PacifiCorp and Cowlitz PUD. 2004. Lewis River Hydroelectric Projects Technical Reports. Technical studies conducted under PacifiCorp and Cowlitz PUD's Lewis River Hydroelectric Projects Alternative Licensing Procedure (ALP). FERC Project Nos. 935, 2071, 2111, and 2213. Available at URL = <http://www.cowlitzpud.org/Swift%20ReLi%20Doc>

RUB = Unconsolidated Bottom (open water), RUS = Unconsolidated Shore (gravel bars), LUB = Unconsolidated Bottom (Lake-limnetic zone), LUS = Unconsolidated Shore (lake-littoral zone), PUB= Palustrine Unconsolidated Bottom, PAB = Palustrine Aquatic Bed, PEM = Palustrine Emergent Wetland, PSS = Palustrine Scrub Shrub Wetlands, PSS/PEM = Palustrine Emergent Wetland/ Palustrine scrub shrub, PFO = Palustrine Forested Wetland, SSI = New Clearcut, SS = Seedling/Sapling Conifer, P = Pole Conifer Forest, MS = Mid-successional Conifer Forest, M= Mature Conifer Forests, OG = Old-growth Conifer Forests, LP = Lodgepole Pine Forest, YUD = Young Upland Deciduous, UD = Upland Deciduous Forests, OW = Oak Woodland, YUM = Young Upland Mixed, UM = Upland Mixed, RS = Riparian Deciduous Shrubland, RD = Riparian Deciduous, YRM = Young Riparian Mixed Forests, RM = Riparian Mixed, RG = Riparian Grassland, MD = Dry Meadow/Grassland, PA = Pasture, RO = Rock Outcropping, RT = Rock Talus, SH = Shrubland, AG = Agriculture, DV = Residential/ Disturbed/Developed, REC = recreational, ROW = Transmission Line ROW

<sup>2</sup> For blasting with >2 lbs pound charge the disturbance distance threshold will be 1 mile

<sup>3</sup>Csuti, B., A.J. Kimerling, T.A O'Neil, M.M. Shaughnessy, E.P. Gaines, and M.M.P Huso. 1997. Atlas of Oregon Wildlife. Oregon State University Press, Corvallis, OR. 492 pp.

<sup>4</sup> Marshall, D.B. M.G. Hunter, and A.L. Conteras, Eds. 2003. Birds of Oregon: A General Reference. Oregon State University Press, Corvallis, OR. 769 Pp

<sup>5</sup> U.S. Forest Service. 1995. Gifford Pinchot National Forest Forest Plan Land and Resource Management Plan Amendment 11. February 1995.

<sup>6</sup> PacifiCorp. 1998. Merwin Wildlife Habitat Management Program Standard Operating Procedures. Portland, Oregon. July 1998.

<sup>7</sup> Watson, James. W. and E.A. Rodrick. 2001. Bald Eagle *Haliaeetus leucocephalus*. Pages 9-1 – 9-15 in Larsen, E. M., J. M. Azerrad, and N. Nordstrom, eds. 2004. Management Recommendations for Washington's Priority Species, Volume IV:Birds. Washington Department of Fish and Wildlife, Olympia. 268pp

<sup>8</sup> PacifiCorp and Cowlitz PUD. 2006. Lewis River Wildlife Habitat Management Plan Standards & Guidelines Document. Hydroelectric Projects Technical Reports. Portland, Oregon July 2006. 68 pp.

<sup>9</sup> Adamus P.R, K. K.Larsen, G.Gillson, and C.R. Miller. 2001. Oregon Breeding Bird Atlas. Oregon Field Ornithologists, P.O. Box 10373, Eugene, OR 97440. CD- ROM.

<sup>10</sup> Desimone, S. and D. Hays. 2004. Northern Goshawk. Pages 6-1 to 6-17 in. E.M Larsen, J.M. Azerrad, and N. Nordstrom, editors. Management Recommendations for Washington's Priority Species, Volume IV: Birds. May 2004. Washington Department of Fish and Wildlife. Olympia, WA. Available at URL [http://wdfw.wa.gov/hab/phs/vol4/phs\\_vol4\\_birds.pdf](http://wdfw.wa.gov/hab/phs/vol4/phs_vol4_birds.pdf). Accessed November 28, 2006.

<sup>11</sup> U.S Department of Interior, U.S Fish and Wildlife Service. 2006. Biological Opinion for the Federal Energy Regulatory Commission Relicensing of the Lewis River Hydroelectric Projects: Merwin (No. 935), Yale (No. 2071), Swift No. 1 (No. 2111), and Swift No. 2 (No. 2213). Lacey, Washington. 182 pp

<sup>12</sup> Hays, D.W. and R.L. Milner. 1999. Peregrine Falcon. Pages 11-1 to 11-4 in. E.M Larsen, J.M. Azerrad, and N. Nordstrom, editors. Management Recommendations for Washington's Priority Species, Volume IV: Birds. May 2004. Washington Department of Fish and Wildlife. Olympia, WA. Available at URL [http://wdfw.wa.gov/hab/phs/vol4/phs\\_vol4\\_birds.pdf](http://wdfw.wa.gov/hab/phs/vol4/phs_vol4_birds.pdf). Accessed November 28, 2006.

<sup>13</sup> Roderick, E. and R. Milner, editors. 1991. Management Recommendations for Washington's Priority Habitats and Species. May 1991. Washington Department of Fish and Wildlife. Olympia, WA. Available at URL <http://wdfw.wa.gov/hab/phs/phs1991.pdf>. Accessed January 18, 2007

<sup>14</sup> E. Larsen, J. M. Azerrad, N. Nordstrom, editors. 2004. Management recommendations for Washington's priority species, Volume IV: Birds. Washington Department of Fish and Wildlife, Olympia, Washington, USA.



**Habitat Thresholds, Vegetation Cover Types, Limiting Operating Periods, and Disturbance Thresholds for Potentially Breeding Raptors on WHMP Lands**

Vegetation Cover Types that Provide Suitable Nesting Habitat for Potentially Breeding Raptors on WHMP Lands <sup>1</sup>				
Species	Habitat	Habitat Threshold	Limited Operating Periods	Disturbance Distance Threshold <sup>2</sup>
<b>American kestrel</b> <i>(Falco sparveius)</i>	Open to semi-open habitats <sup>3</sup> . Nest in cavities in large trees, as well as cut banks and cliffs <sup>4</sup>	660 ft (201 m)	April 15 to August 1 <sup>6</sup>	660 ft (201 m)
<b>Bald eagle</b> <i>(Haliaeetus Leucocephalus)</i>	Associated with large bodies of water that support ample prey <sup>3</sup> Nest is large prominent trees average between 42 to 67 in (107 to 170 cm) dbh <sup>4</sup> .	Primary zone within 400 ft (120 m) of nest tree Secondary zone 400 to 800 ft (12 to 240m) of nest tree <sup>7</sup>	Nesting Jan 1 to Aug 31 Key Winter Period Nov 15 to Mar 31 <sup>8</sup>	1320 ft (400 m) or 2640 ft (800 m) line-of-sight
<b>Barn owl</b> <i>(Tyto alba)</i>	Open to semi-open habitats: grasslands, meadows, clear-cuts, marshes, agricultural fields, and urban areas <sup>3</sup> Breeds in open buildings, nest boxes, and cut banks near open lands	660 ft (201 m)	April 1 to September 15 <sup>9</sup>	660 ft (201 m)
<b>Barred owl</b> <i>(Strix varia)</i>	Conifer to mixed-conifer deciduous forests <sup>4</sup> . Nest in cavities, tops of snags, and abandon raptor or corvid stick nests. <sup>3</sup>	660 ft (201 m)	March 1 to August 30	660 ft (201 m)
<b>Cooper's hawk</b> <i>(Accipiter cooperii)</i>	Coniferous, mixed-coniferous, and deciduous forests. Mature forests with widely spaced trees <sup>4</sup>	660 ft (201 m)	April 1 to August 15 <sup>9</sup>	660 ft (201 m)
<b>Golden Eagle</b> <i>(Aquila chrysaetos)</i>	Associated with open areas. Nests generally on cliffs and occasionally in trees. More common east of the Cascades, but golden eagles have been found in mature and old-growth forests near the edges of clearcuts and other open areas in western Washington. <sup>14</sup>	980 ft (300 m) <sup>14</sup>	February 15 to July <sup>14</sup>	980 ft (300 m) <sup>14</sup>
<b>Great-horned owl</b> <i>(Bubo virginianus)</i>	All forest types, agricultural areas, and urban areas. Nest in platforms or tree cavities, or cliff ledges. May use stick nests built by hawks, eagles, and ravens <sup>4</sup>	660 ft (201 m)	February 1 to July 31 <sup>9</sup>	660 ft (201 m)
<b>Merlin</b> <i>(Falco columbarius)</i>	Prefer open to semi-open habitats. In western Washington often found near estuaries, lakes, reservoirs because the areas provide breaks in the forest. Nest in old raven, hawk nest, or tree cavities, or cliff ledges. <sup>4</sup>	660 ft (201 m)	April 15 to August 1	660 ft (201 m)
<b>Northern goshawk</b> <i>(Accipiter gentilis)</i>	Home range consists of varied amount of forest age classes and conditions. Nest in coniferous trees in mature or old-growth stands that are greater than 20 acres in size Stands include large trees,> 50% canopy closure, multi-layered canopy, gaps in the canopy, abundance of large diameter crowns, and the presence of shade tolerant trees. <sup>10</sup>	Post-fledgling Area (PFA) equal to 420 ac (170 ha) centered around a nest or a 2415 ft (736 m) radius around a nest tree <sup>10</sup>	March 1 to September 30 <sup>10</sup>	2640 ft (800 m) from nest tree <sup>10</sup>
<b>Northern harrier</b> <i>(Circus cyaneus)</i>	Open to semi-open habitats grasslands, meadows, marshes, and agricultural fields. Nest on the ground in patches of tall dense vegetation. <sup>4</sup>	660 ft (201 m)	March 21 to September 15 <sup>3</sup>	660 ft (201 m)
<b>Northern pygmy-owl</b> <i>(Glaucidium gnoma)</i>	Coniferous and mixed coniferous forests. <sup>3</sup> Secondary cavity nester using woodpecker and flicker holes or natural cavities. <sup>4</sup>	660 ft (201 m)	April 1 to July 15 <sup>4</sup>	660 ft (201 m)
<b>Northern Saw-whet owl</b> <i>(Aegolius acadicus)</i>	Coniferous and riparian forests. Secondary cavity nester using woodpecker and flicker holes or natural cavities. <sup>4</sup>	660 ft (201 m)	April 1 to July 15 <sup>4</sup>	660 ft (201 m)

## Habitat Thresholds, Vegetation Cover Types, Limiting Operating Periods, and Disturbance Thresholds for Potentially Breeding Raptors on WHMP Lands

Species	Habitat	Habitat Threshold	Limited Operating Periods	Disturbance Distance Threshold <sup>2</sup>
<b>Northern spotted owl</b> ( <i>Strix occidentalis</i> )	Stands at least 16 in. (41 cm) average dbh with at least 4 trees per acre (10 trees per ha) that are $\geq$ 30 in. (76 cm) dbh or larger, Numerous large snags (typically > 2/ ac [5/ha]), numerous down logs (typically > 15 tons/ac [33.6 metric tons/ha]), multi-layered canopy, greater than 40% canopy (typically > 60%) <sup>8</sup>	500 acres (202 ha) and 2,663 acres (1,078 ha) within 0.7-mile (1.1-km) and 1.82-mile radius (2.9 km), respectively, of an active northern spotted owl home range <sup>8</sup>	March 1 to August 31. Critical nesting period March 1 to June 30 <sup>11</sup>	360 ft (110 m) <sup>8</sup>
<b>Osprey</b> ( <i>Pandion haliaetus</i> )	Associated with bodies of water that support ample fish. Nest in large trees with broken tops or snags. <sup>4</sup>	660 ft (201 m) <sup>13</sup>	April 1 to September 30 <sup>10</sup>	660 ft (201 m) <sup>13</sup>
<b>Peregrine falcon</b> ( <i>Falco peregrinus</i> )	Nest on cliff ledges ranging from 75 to 2000 feet (23 to 610 m) in height and within ¼ to ½ mile (0.40 to 0.80 km) of riparian or lacustrine habitat <sup>12</sup>	0.5 mi. (0.80 km) between March 1 and July 31 and 0.25 mi. (0.40 km) August 1 to February 28 <sup>12</sup>	March 1 to July 31 <sup>13</sup>	0.5 mi. (0.80 km) between March 1 and July 31 and 0.25 mi. (0.40 km) August 1 to February 28 <sup>12</sup>
<b>Red-tailed hawk</b> ( <i>Buteo jamaicensis</i> )	Open to semi-open habitats, but will use woodlands. Constructs stick nests in tall trees and utility poles. <sup>4</sup>	660 ft (201 m)	March 1 to September 15 <sup>3</sup>	660 ft (201 m)
<b>Sharp-shinned hawk</b> ( <i>Accipiter striatus</i> )	Associated with coniferous forests, mixed coniferous deciduous forests, and riparian woodlands. Nest are built on a limb or in the fork of a limb <sup>3</sup>	660 ft (201 m)	April 15 to August 31 <sup>4</sup>	660 ft (201 m)
<b>Western screech-owl</b> ( <i>Otus kennicotti</i> )	Forest edges and riparian woodlands, especially those with older deciduous trees, adjacent to open pastures or fields. <sup>4</sup> Secondary cavity nester using woodpecker and flicker holes or natural cavities. Requires trees that $\geq$ 12 inches (30 centimeters) in dbh <sup>3</sup>	660 ft (201 m)	April 15 to August 31 <sup>4,9</sup>	660 ft (201 m)

<sup>1</sup>PacifiCorp and Cowlitz PUD. 2004. Lewis River Hydroelectric Projects Technical Reports. Technical studies conducted under PacifiCorp and Cowlitz PUD's Lewis River Hydroelectric Projects Alternative Licensing Procedure (ALP). FERC Project Nos. 935, 2071, 2111, and 2213. Available at URL = <http://www.cowlitzpud.org/Swift%20ReLi%20Docs/>

<sup>2</sup> For blasting with >2 lbs pound charge the disturbance distance threshold will be 1 mile.

<sup>3</sup>Csuti, B., A.J. Kimerling, T.A O'Neil, M.M. Shaughnessy, E.P. Gaines, and M.M.P Huso. 1997. Atlas of Oregon Wildlife. Oregon State University Press, Corvallis, OR. 492 pp.

<sup>4</sup> Marshall, D.B, M.G. Hunter, and A.L. Conteras, Eds. 2003. Birds of Oregon: A General Reference. Oregon State University Press, Corvallis, OR. 769 Pp

<sup>5</sup> U.S. Forest Service. 1995. Gifford Pinchot National Forest Forest Plan Land and Resource Management Plan Amendment 11. February 1995.

<sup>6</sup> PacifiCorp. 1998. Merwin Wildlife Habitat Management Program Standard Operating Procedures. Portland, Oregon. July 1998.

<sup>7</sup> Watson, James. W. and E.A. Rodrick. 2001. Bald Eagle *Haliaeetus leucocephalus*. Pages 9-1 – 9-15 in Larsen, E. M., J. M. Azerrad, and N. Nordstrom, eds. 2004. Management Recommendations for Washington's Priority Species, Volume IV: Birds. Washington Department of Fish and Wildlife, Olympia. 268pp

<sup>8</sup> PacifiCorp and Cowlitz PUD. 2006. Lewis River Wildlife Habitat Management Plan Standards & Guidelines Document. Hydroelectric Projects Technical Reports.

<sup>9</sup> Adamus P.R, K. K.Larsen, G.Gillson, and C.R. Miller. 2001. Oregon Breeding Bird Atlas. Oregon Field Ornithologists, P.O. Box 10373, Eugene, OR 97440. CD- ROM.

<sup>10</sup> Desimone, S. and D. Hays. 2004. Northern Goshawk. Pages 6-1 to 6-17 in. E.M Larsen, J.M. Azerrad, and N. Nordstrom, editors. Management Recommendations for Washington's Priority Species, Volume IV: Birds. May 2004. Washington Department of Fish and Wildlife. Olympia, WA. Available at URL [http://wdfw.wa.gov/hab/phs/vol4/phs\\_vol4\\_birds.pdf](http://wdfw.wa.gov/hab/phs/vol4/phs_vol4_birds.pdf). Accessed November 28, 2006.

<sup>11</sup> U.S Department of Interior, U.S Fish and Wildlife Service. 2006. Biological Opinion for the Federal Energy Regulatory Commission Relicensing of the Lewis River

<sup>12</sup> Hays, D.W. and R.L. Milner. 1999. Peregrine Falcon. Pages 11-1 to 11-4 in. E.M Larsen, J.M. Azerrad, and N. Nordstrom, editors. Management Recommendations for Washington's Priority Species, Volume IV: Birds. May 2004. Washington Department of Fish and Wildlife. Olympia, WA. Available at URL

<sup>13</sup> Roderick, E. and R. Milner, editors. 1991. Management Recommendations for Washington's Priority Habitats and Species. May 1991. Washington Department of Fish and Wildlife. Olympia, WA. Available at URL <http://wdfw.wa.gov/hab/phs/phs1991.pdf>. Accessed January 18, 2007.

<sup>14</sup> E. Larsen, J. M. Azerrad, N. Nordstrom, editors. 2004. Management recommendations for Washington's priority species, Volume IV: Birds. Washington Department of Fish and Wildlife, Olympia, Washington, USA.

January 7, 2008

**Subject: Lewis River Public Meeting – Shoreline Management Plan**

PacifiCorp Energy invites you to the second public meeting as part of our effort to develop a comprehensive Shoreline Management Plan (SMP). The SMP will document how the company will manage the multiple resources and uses of the shorelines along the Lewis River Hydroelectric Project reservoirs in a manner that is consistent with license requirements and project purposes, and addresses the needs of the public.

As owner and operator of the hydroelectric projects that form Merwin, Yale, and Swift reservoirs, PacifiCorp Energy is committed to developing a forward looking SMP, encompassing the spirit and objectives of the Lewis River Settlement Agreement. The SMP will serve as a tool to assist in effectively analyzing appropriate shoreline uses within the Project boundaries, as well as provide a supportable and defensible means for shoreline management and permitting decisions.

At the meeting, Kleinschmidt Associates will present the draft shoreline management classifications that include Resource Management, Integrated Use, and Project Works. They will also present draft allowable uses for each of the shoreline classifications. Time will be available to provide verbal input on these draft determinations and other work products.

To view the draft Shoreline Management Plan, draft shoreline classification maps and related allowable uses, Federal Energy Regulatory Commission project boundary maps, PowerPoint presentations, revised SMP Schedule, and the Lewis River Settlement Agreement please visit us at:

<http://www.pacificorp.com/Article/Article76278.html>

Everyone is welcome. Please feel free to contact me at the number listed below.

**Place:** Lewis River Golf Course - Clubhouse  
3209 Lewis River Road  
Woodland, WA

**Date:** February 6, 2008

**Time:** 7:00pm – 9:00pm

**Contact:** David Moore, PacifiCorp (503) 813-6945

Thank you for your interest in the above matter, we look forward to your participation.

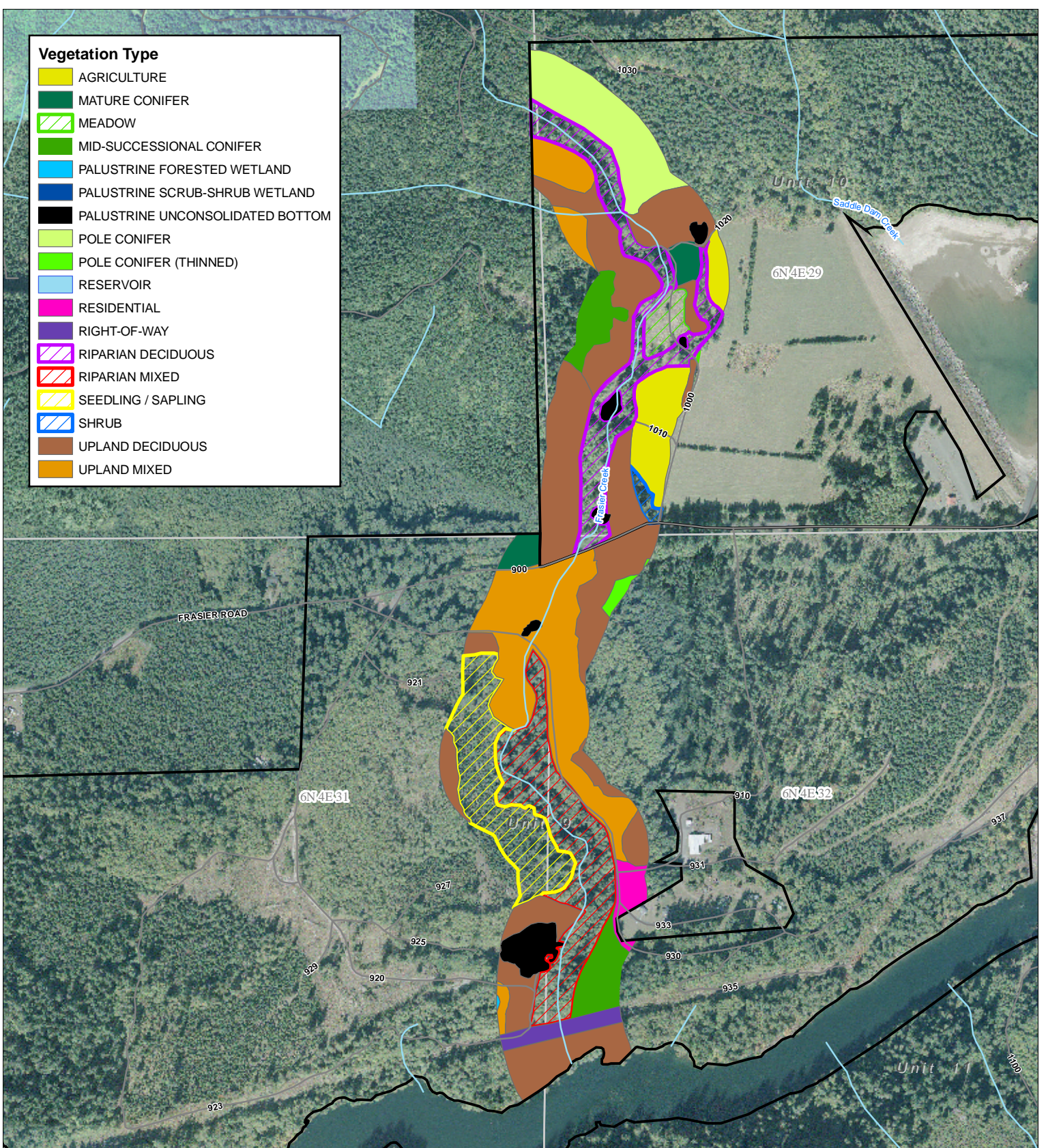
Sincerely,

<David Moore>

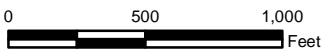
David Moore  
Environmental Analyst

**Vegetation Type**

- AGRICULTURE
- MATURE CONIFER
- MEADOW
- MID-SUCCESSIONAL CONIFER
- PALUSTRINE FORESTED WETLAND
- PALUSTRINE SCRUB-SHRUB WETLAND
- PALUSTRINE UNCONSOLIDATED BOTTOM
- POLE CONIFER
- POLE CONIFER (THINNED)
- RESERVOIR
- RESIDENTIAL
- RIGHT-OF-WAY
- RIPARIAN DECIDUOUS
- RIPARIAN MIXED
- SEEDLING / SAPLING
- SHRUB
- UPLAND DECIDUOUS
- UPLAND MIXED



**Lewis River  
Vegetation Types within  
100m of Frasier Creek**



**Legend**

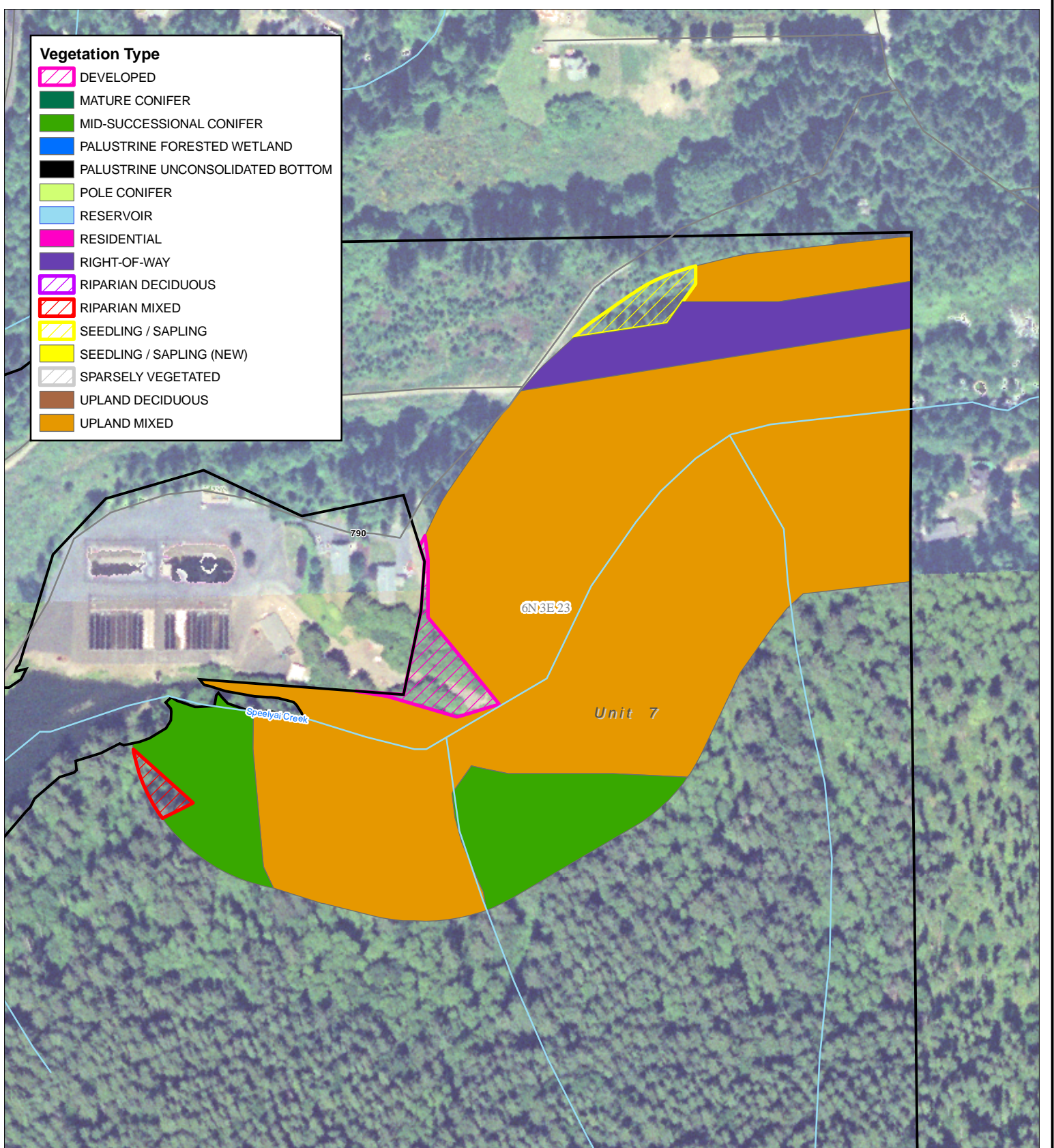
- Streams
- Roads
- Section
- Management Unit



**Data Management/  
Geographic Information Systems**  
gisdept@pacificorp.com

Data are projected in UTM Zone 10, NAD83, meters.

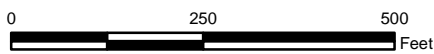
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- Vegetation Type**
- DEVELOPED
  - MATURE CONIFER
  - MID-SUCCESSIONAL CONIFER
  - PALUSTRINE FORESTED WETLAND
  - PALUSTRINE UNCONSOLIDATED BOTTOM
  - POLE CONIFER
  - RESERVOIR
  - RESIDENTIAL
  - RIGHT-OF-WAY
  - RIPARIAN DECIDUOUS
  - RIPARIAN MIXED
  - SEEDLING / SAPLING
  - SEEDLING / SAPLING (NEW)
  - SPARSELY VEGETATED
  - UPLAND DECIDUOUS
  - UPLAND MIXED

**Lewis River**  
Vegetation Types within  
100m of Speelyai Creek

Unit 7



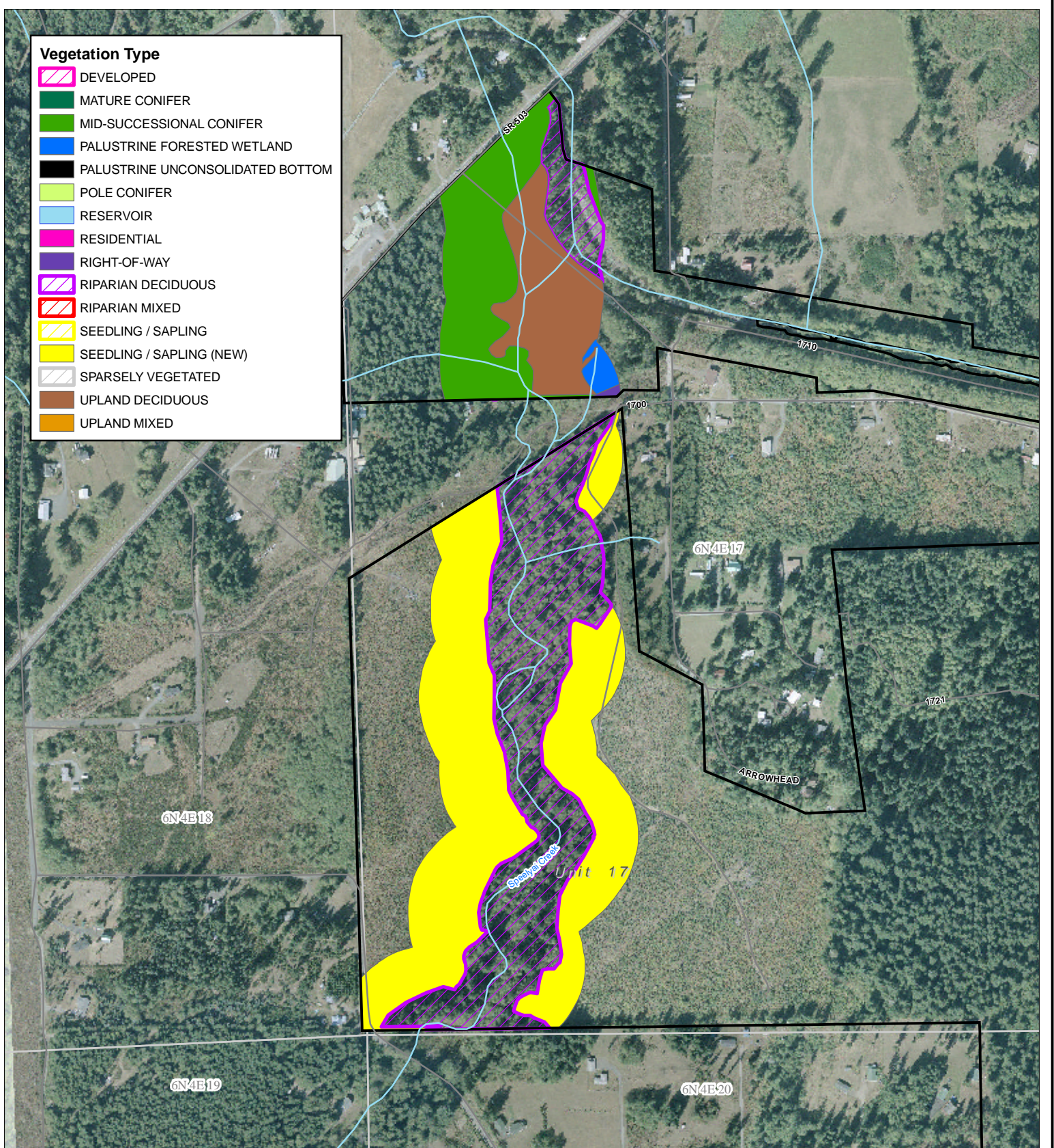
- Legend**
- Streams
  - Roads
  - Section
  - Management Unit

















**Data Management/  
Geographic Information Systems**  
gisdept@pacificorp.com

Data are projected in UTM Zone 10, NAD83, meters.

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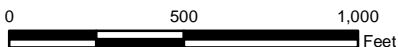
**Vegetation Type**

-  DEVELOPED
-  MATURE CONIFER
-  MID-SUCCESSIONAL CONIFER
-  PALUSTRINE FORESTED WETLAND
-  PALUSTRINE UNCONSOLIDATED BOTTOM
-  POLE CONIFER
-  RESERVOIR
-  RESIDENTIAL
-  RIGHT-OF-WAY
-  RIPARIAN DECIDUOUS
-  RIPARIAN MIXED
-  SEEDLING / SAPLING
-  SEEDLING / SAPLING (NEW)
-  SPARSELY VEGETATED
-  UPLAND DECIDUOUS
-  UPLAND MIXED





**Lewis River**

Vegetation Types within  
100m of Speelyai Creek

Unit 17



**Legend**

-  Streams
-  Roads
-  Section
-  Management Unit



**Data Management/  
Geographic Information Systems**  
gisdept@pacificorp.com

Data are projected in UTM Zone 10, NAD83, meters.

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Table 5.1 Allowed Uses by Shoreline Classification

	Integrated Use	Resource Management	Project Operations
<b>Uses and Facilities</b>			
Multi-boat slips	YES	Only as administered/ approved by PacifiCorp and its authorized agents <sup>1</sup>	NO
Single Family docks <sup>2</sup>	YES	NO	NO
Retaining walls <sup>3</sup>	YES	NO	As needed for project operations
Erosion control measures	YES	Only natural or bio control measures allowed	As needed for project operations
Public boat ramps	YES	Only as administered/ approved by PacifiCorp and its authorized agents	
Marine trestles, railways, trams & lifts	YES	NO	As needed for project operations
Moorings	YES	YES	As needed for project operations
Dredging <sup>4</sup>	YES	NO	As needed for project operation
Log booms	YES	YES	As needed for project operations
Municipal/agricultural water withdrawal & discharges	YES	Only as administered/ approved by PacifiCorp and its authorized agents	NO
Private/residential water withdrawal	YES	YES	NO
Water elevation gaging stations	YES	YES	YES
Vegetation removal <sup>5</sup>	YES	Only as administered/ approved by PacifiCorp and its authorized agents	As needed for project operations
Vegetation plantings <sup>5</sup>	YES		As needed for project operations
Stairways & walkways	YES	Only allowed at designated dispersed sites	As needed for project operations
Foot pathways	YES	YES	
Public recreation sites	YES	Only as administered/ approved by PacifiCorp and its authorized agents	
Private recreation facilities	YES	NO	NO
Private beaches/common areas	YES	NO	NO
Fish/wildlife support activities & devices	YES	YES	YES
≤ 50% In kind repair or replacement of <b>Existing</b> use within existing footprint	Yes if structure has existing permit		

<sup>1</sup> Authorized agents include parties to the Settlement Agreement

<sup>2</sup> Single family docks are allowed if location is not conducive to a multi-user facility to service all residents of a particular area

<sup>3</sup> Retaining walls are not the preferred method of erosion control or bank stabilization. PacifiCorp will only authorize these types of structures when no other measures are feasible

<sup>4</sup> All dredging activities must be reviewed and approved by FERC

<sup>5</sup> While PacifiCorp does not regulate the removal or planting of vegetation in Integrated Use classification, other county and state regulatory agencies may. Anyone one considering these activities should verify the proposed action is allowable under state law.

**Percent Canopy Cover of Trees and Shrubs within 100 meters of Frasier Creek**  
(Habitat Suitability Index Models: Minks SIV5<sup>1</sup>)

<b>Vegetation Cover Type</b>	<b>SEGHAB<sup>2</sup></b>	<b>Acres in 100m Buffer</b>	<b>Percent of Buffer</b>	<b>SEGHAB Average Percent Cover (Average of Tree/Shrub Cover for SEGHAB polygons)<sup>3</sup></b>	<b>Weighted Mink Tree/Shrub Value (Percent of Buffer x SEGHAB average percent cover)</b>
Agriculture	M-AG	4.29	4.85%	17.70	0.86
Mature Conifer	M-M	1.53	1.73%	100.00	1.73
Meadow	M-MD	1.48	1.68%	8.58	0.14
Mid-successional Conifer	M-MS	3.86	4.37%	96.98	4.23
Palustrine Forested Wetland	M-PFO	0.02	0.03%	67.89	0.02
Palustrine Unconsolidated Bottom	M-PUB	2.19	2.48%	0.00	0.00
Pole Conifer	M-P	5.99	6.78%	99.20	6.72
Pole Conifer (Thinned)	M-P-t	0.37	0.42%	83.67	0.35
Residential <sup>4</sup>	M-RES	1.08	1.22%	0.00	0.00
Right-of-way	M-ROW	1.30	1.47%	10.78	0.16
Riparian Deciduous	M-RD	8.67	9.80%	94.55	9.27
Riparian Mixed	M-RM	10.36	11.72%	96.30	11.28
Seedling/Sapling	M-SS	7.55	8.54%	56.81	4.85
Shrub	M-SH	0.47	0.53%	52.57	0.28
Upland Deciduous	M-UD	25.22	28.52%	97.18	27.72
Upland Mixed	M-UM	14.04	15.88%	96.69	15.35
<b>Sum Total</b>		<b>88.43</b>			<b>82.97</b>
<b>Averages</b>				61.18	5.19
<b>X range = Range percent canopy cover of trees and shrubs within 100m of the water edge<sup>1</sup></b>	0.00	100.00	<b>Y range = Range of Suitability Index (SIV5)<sup>1</sup></b>	0.10	1.00
<b>HSI Value for Sum Total of Weighted Mink Tree/Shrub Cover Value (82.97) =</b>					<b>1.00</b>

<sup>1</sup> Allen, A.W. 1986. Habitat suitability index models: mink, revised. U.S.Fish Wildl. Serv. Biol. Rep. 82 (10.127). 23 PP. [First printed as: FWS/OBS-82/10.61, October 1983.]

<sup>2</sup> SEGHAB = Segment Habitat Type with segment being the reservoir analysis area (i.e., M= Merwin, Y=Yale) and habit type is equivalent of vegetation cover type. This is described in: PacifiCorp and Cowlitz PUD. 2004. Lewis River Hydroelectric Projects Technical Report 5.2 TER 2 Habitat Evaluation Procedures (HEP) Study. FERC Project Nos. 935, 2071, 2111, and 2213

<sup>3</sup> SEGHAB polygons tree/shrub Cover data averages are determined using the tree/shrub cover values in the SEGHAB\_TreeShrubCover Spreadsheet. SEGHAB\_TreeShrubCover spreadsheet was copied from LEWIS HSI122001.xls workbook Values spreadsheet located at S:\ENVS\RSV\WILD\Hydro Projects\Lewis River\HEP Data\OriginalHEPdata

<sup>4</sup> Residential (M-RES) vegetation cover type was not included in the HEP study; therefore it does not have tree/shrub cover value. Because these areas are disturbed it assumed that the average tree/shrub cover values are 0.00.



**Percent Canopy Cover of Trees and Shrubs within 100 meters of Speelyai Creek**  
(Habitat Suitability Index Models: Minks SIV5<sup>1</sup>)

Vegetation Cover Type	SEGHAB <sup>2</sup>	Acres in 100m Buffer	Percent of Buffer	SEGHAB Average Percent Cover (Average of Tree/Shrub Cover for SEGHAB polygons) <sup>3</sup>	Weighted Mink Tree/Shrub Value (Percent of Buffer x SEGHAB average percent cover)
Developed <sup>4</sup>	M-DV	0.47	0.58%	0.00	0.00
Mid-successional Conifer	M-MS	2.79	3.41%	96.98	3.31
Mid-successional Conifer	Y-MS	8.12	9.90%	95.30	9.44
Palustrine Forested Wetland	Y-PFO	0.48	0.58%	70.90	0.41
Right-of-way	M-ROW	1.49	1.82%	10.78	0.20
Right-of-way	Y-ROW	0.08	0.09%	8.30	0.01
Riparian Deciduous	Y-RD	21.24	25.91%	100.00	25.91
Riparian Mixed	M-RM	0.13	0.15%	96.30	0.15
Seedling/Sapling	M-SS	0.29	0.36%	56.81	0.20
Seedling/Sapling (New) <sup>5</sup>	Y-SS1	23.75	28.98%	4.50	1.30
Upland Deciduous	Y-UD	5.70	6.96%	97.04	6.75
Upland Mixed	M-UM	17.42	21.26%	96.69	20.56

**Sum Total** **81.95** **61.13** **68.23**

**Averages**   61.13 5.69

<b>X range = Range percent canopy cover of trees and shrubs within 100m of the water edge<sup>1</sup></b>	0.00	100.00	<b>Y range = Range of Suitability Index (SIV5)<sup>1</sup></b>	0.10	1.00

**HSI Value for Sum Total of Weighted Mink Tree/Shrub Cover Value (68.23) = 0.71**

<sup>1</sup> Allen, A.W. 1986. Habitat suitability index models: mink, revised. U.S.Fish Wildl. Serv. Biol. Rep. 82 (10.127). 23 PP. [First printed as: FWS/OBS-82/10.61, October 1983.]

<sup>2</sup> SEGHAB = Segment Habitat Type with the segment being the reservoir analysis area (i.e., M= Merwin, Y=Yale) and habit type is equivalent of vegetation cover type. This is described in: PacifiCorp and Cowlitz PUD. 2004. Lewis River Hydroelectric Projects Technical Report 5.2 TER 2 Habitat Evaluation Procedures (HEP) Study. FERC Project Nos. 935, 2071, 2111, and 2213

<sup>3</sup> SEGHAB polygons tree/shrub cover data averages are determined using the tree/shrub cover values in the SEGHAB\_TreeShrubCover Spreadsheet. SEGHAB\_TreeShrubCover spreadsheet was copied from LEWIS HSI122001.xls workbook values spreadsheet located at S:\ENVS RVS\WILD\Hydro Projects\Lewis River\HEP Data\OriginalHEPdata

<sup>4</sup> Developed (M-DV) vegetation cover type was not included in the HEP study; therefore it does not have tree/shrub cover value. Because these areas are disturbed it assumed that the average tree/shrub cover values are 0.00.

<sup>5</sup> Seedling/Sapling (New) (Y-SS1) vegetation cover type does not have HEP polygons for Yale; therefore SEGHAB average percent cover was an average of M-SS1 and SW-SS1 tree/shrub cover values.

**Mink HEP Data**

Location	Habitat Type	SEGHAB	HEP Polygon #	Max Length of Transect	Sum of Tree/Shrub Length	Percent of Tree/Shrub Cover	Average SEGHAB Tree/Shrub Percent Cover
Eagle Island	PFO	EI-PFO	3549	100	91.00	91.00	67.15
Eagle Island	PSS	EI-PSS	3544	100	44.90	44.90	67.15
Eagle Island	RD	EI-RD	3549	100	70.20	70.20	
Eagle Island	RD	EI-RD	3554	100	89.60	89.60	
Eagle Island	RD	EI-RD	3555	100	98.80	98.80	86.20
Eagle Island	RM	EI-RM	3546	100	96.40	96.40	96.40
Eagle Island	RS	EI-RS	3559	100	50.50	50.50	50.50
Eagle Island	RUB	EI-RUB	3543	100	0.00	0.00	
Eagle Island	RUB	EI-RUB	E.I.	50	0.00	0.00	0.00
Eagle Island	SH	EI-SH	3555b	50	30.30	60.60	60.60
Eagle Island	UD	EI-UD	3556	100	100.00	100.00	100.00
Eagle Island	YRM	EI-YRM	3545	100	85.20	85.20	85.20
L.M.	LUB	L.M.-LUB	XXXX		0.00	0.00	0.00
L.R.	RUB	L.R.-RUB	NORTH		0.00	0.00	0.00
Merwin S	AG	M-AG	3004	50	10.40	20.80	
Merwin S	AG	M-AG	3004b	100	14.60	14.60	17.70
Merwin N	LUB	M-LUB	x		0.00	0.00	
Merwin N	LUB	M-LUB	xx		0.00	0.00	
Merwin S	LUB	M-LUB	M.L.	5	0.00	0.00	
Merwin S	LUB	M-LUB	M.L.1	5	0.00	0.00	
Merwin S	LUB	M-LUB	x	5	0.00	0.00	0.00
Merwin N	M	M-M	2051	100	100.00	100.00	
Merwin S	M	M-M	2516	100	100.00	100.00	
Merwin S	M	M-M	2552	100	100.00	100.00	
Merwin S	M	M-M	2865	100	100.00	100.00	100.00
Merwin N	MD	M-MD	2355	100	34.30	34.30	
Merwin S	MD	M-MD	3059	50	0.00	0.00	
Merwin S	MD	M-MD	3064	100	0.00	0.00	
Merwin S	MD	M-MD	3165	100	0.00	0.00	8.58
Merwin N	MS	M-MS	1751	100	91.50	91.50	
Merwin N	MS	M-MS	1871	100	96.10	96.10	
Merwin N	MS	M-MS	2057	100	95.50	95.50	
Merwin N	MS	M-MS	2295	100	100.00	100.00	
Merwin N	MS	M-MS	2812	100	100.00	100.00	
Merwin N	MS	M-MS	3003	100	92.40	92.40	
Merwin N	MS	M-MS	3010	100	98.30	98.30	
Merwin S	MS	M-MS	2423	100	94.80	94.80	
Merwin S	MS	M-MS	2585	100	98.20	98.20	
Merwin S	MS	M-MS	2943	100	100.00	100.00	
Merwin S	MS	M-MS	2990	100	100.00	100.00	96.98
Merwin N	MS-T	M-MS-T	1725	100	94.70	94.70	
Merwin N	MS-T	M-MS-T	1918	100	93.30	93.30	
Merwin N	MS-T	M-MS-T	2114	100	95.90	95.90	
Merwin N	MS-T	M-MS-T	2357	100	96.90	96.90	
Merwin N	MS-T	M-MS-T	3828	100	60.70	60.70	
Merwin S	MS-T	M-MS-T	2719	100	46.90	46.90	
Merwin S	MS-T	M-MS-T	2836	100	61.60	61.60	
Merwin S	MS-T	M-MS-T	3237	100	84.50	84.50	79.31
Merwin N	OG	M-OG	1890	100	94.90	94.90	
Merwin N	OG	M-OG	2127	100	76.80	76.80	
Merwin N	OG	M-OG	2177	100	100.00	100.00	90.57
Merwin N	OR	M-OR	2320	90	47.40	52.67	
Merwin S	OR	M-OR	2833	100	64.70	64.70	
Merwin S	OR	M-OR	3052	50	10.40	20.80	46.06
Merwin N	OW	M-OW	1879	50	13.70	27.40	
Merwin N	OW	M-OW	2110	80	33.30	41.63	
Merwin N	OW	M-OW	2193	50	21.30	42.60	37.21
Merwin N	P	M-P	2550	100	100.00	100.00	
Merwin N	P	M-P	2750	100	97.40	97.40	
Merwin N	P	M-P	2759	100	97.80	97.80	

**Mink HEP Data**

Location	Habitat Type	SEGHAB	HEP Polygon #	Max Length of Transect	Sum of Tree/Shrub Length	Percent of Tree/Shrub Cover	Average SEGHAB Tree/Shrub Percent Cover
Merwin S	P	M-P	424	100	100.00	100.00	
Merwin S	P	M-P	2676	100	99.30	99.30	
Merwin S	P	M-P	2720	100	100.00	100.00	
Merwin S	P	M-P	2722	100	99.10	99.10	
Merwin S	P	M-P	3180	100	100.00	100.00	99.20
Merwin N	PEM	M-PEM	2123	100	7.40	7.40	
Merwin S	PEM	M-PEM	3107	50	0.00	0.00	3.70
Merwin N	PFO	M-PFO	1974	100	68.60	68.60	
Merwin N	PFO	M-PFO	2792	100	87.10	87.10	
Merwin S	PFO	M-PFO	3166	124	59.50	47.98	67.89
Merwin N	PSS	M-PSS	3058	100	93.30	93.30	
Merwin N	PSS	M-PSS	3069	100	34.40	34.40	63.85
Merwin N	P-T	M-P-T	1993	100	98.30	98.30	
Merwin N	P-T	M-P-T	2608	100	77.80	77.80	
Merwin N	P-T	M-P-T	2651	100	90.30	90.30	
Merwin S	P-T	M-P-T	3221	100	82.90	82.90	87.33
Merwin N	PUB	M-PUB	3008	100	0.00	0.00	
Merwin N	PUB	M-PUB	3106	110	0.00	0.00	
Merwin S	PUB	M-PUB	3186	116		0.00	
Merwin S	PUB	M-PUB	3209	100	0.00	0.00	0.00
Merwin N	RD	M-RD	1829	100	95.00	95.00	
Merwin N	RD	M-RD	3369	100	94.10	94.10	94.55
Merwin N	RM	M-RM	1780	100	92.20	92.20	
Merwin N	RM	M-RM	2549	100	96.70	96.70	
Merwin S	RM	M-RM	2894	100	100.00	100.00	96.30
Merwin N	ROW	M-ROW	1933	100	0.00	0.00	
Merwin N	ROW	M-ROW	2045	100	13.80	13.80	
Merwin N	ROW	M-ROW	2723	100	22.30	22.30	
Merwin N	ROW	M-ROW	3449	50	4.10	8.20	
Merwin S	ROW	M-ROW	3205	100	11.40	11.40	
Merwin S	ROW	M-ROW	3370	50	4.50	9.00	10.78
Merwin N	RS	M-RS	2582	80	79.20	99.00	
Merwin S	RS	M-RS	3377	80	63.10	78.88	88.94
Merwin N	SH	M-SH	1956	100	94.20	94.20	
Merwin N	SH	M-SH	1990	50	14.60	29.20	
Merwin S	SH	M-SH	3055	100	34.30	34.30	52.57
Merwin N	SS	M-SS	1724	100	55.40	55.40	
Merwin N	SS	M-SS	1977	100	30.80	30.80	
Merwin N	SS	M-SS	2521	50	30.40	60.80	
Merwin N	SS	M-SS	3085	100	97.70	97.70	
Merwin N	SS	M-SS	3112	100	20.20	20.20	
Merwin S	SS	M-SS	3158	50	40.20	80.40	
Merwin S	SS	M-SS	3232	100	52.40	52.40	56.81
Merwin N	SSI	M-SSI	2071	100	23.00	23.00	
Merwin N	SSI	M-SSI	2212	100	0.70	0.70	
Merwin N	SSI	M-SSI	2656	100	9.80	9.80	
Merwin S	SSI	M-SSI	3067	100	31.80	31.80	
Merwin S	SSI	M-SSI	3088	100	0.40	0.40	
Merwin S	SSI	M-SSI	3222	100	0.00	0.00	10.95
Merwin N	UD	M-UD	1831	100	100.00	100.00	
Merwin N	UD	M-UD	2058	100	100.00	100.00	
Merwin N	UD	M-UD	2934	100	97.50	97.50	
Merwin N	UD	M-UD	2942	50	43.70	87.40	
Merwin S	UD	M-UD	2679	100	98.20	98.20	
Merwin S	UD	M-UD	3105	100	100.00	100.00	97.18
Merwin N	UM	M-UM	1702	100	97.00	97.00	
Merwin N	UM	M-UM	1900	100	97.40	97.40	
Merwin N	UM	M-UM	1975	80	70.00	87.50	
Merwin N	UM	M-UM	2142	100	100.00	100.00	
Merwin N	UM	M-UM	2866	100	99.50	99.50	

**Mink HEP Data**

Location	Habitat Type	SEGHAB	HEP Polygon #	Max Length of Transect	Sum of Tree/Shrub Length	Percent of Tree/Shrub Cover	Average SEGHAB Tree/Shrub Percent Cover
Merwin N	UM	M-UM	3097	100	99.50	99.50	
Merwin S	UM	M-UM	2382	100	94.00	94.00	
Merwin S	UM	M-UM	2383	100	94.00	94.00	
Merwin S	UM	M-UM	2715	75	73.50	98.00	
Merwin S	UM	M-UM	2895	100	100.00	100.00	96.69
Merwin N	UM-T	M-UM-T	2462	100	87.60	87.60	87.60
Merwin N	YUD	M-YUD	1698	100	98.00	98.00	
Merwin S	YUD	M-YUD	2513	100	96.60	96.60	97.30
Merwin N	YUM	M-YUM	1668	100	100.00	100.00	
Merwin N	YUM	M-YUM	1783	100	80.80	80.80	
Merwin S	YUM	M-YUM	2559	100	83.80	83.80	88.20
Swift Canal	LP	SBC-LP	730	100	66.80	66.80	
Swift Canal	LP	SBC-LP	730a	100	85.20	85.20	
Swift Canal	LP	SBC-LP	731a	100	51.40	51.40	67.80
Swift Canal	MD	SBC-MD	759	50	17.50	35.00	35.00
Swift Canal	MS	SBC-MS	576	100	76.20	76.20	
Swift Canal	MS	SBC-MS	670	100	99.20	99.20	
Swift Canal	MS	SBC-MS	679	100	98.00	98.00	91.13
Swift Bypass	P	SBC-P	703	100	100.00	100.00	
Swift Bypass	P	SBC-P	906	100	79.50	79.50	89.75
Swift Canal	PEM	SBC-PEM	551	100	3.20	3.20	
Swift Canal	PEM	SBC-PEM	554	100	0.80	0.80	2.00
Swift Bypass	PFO	SBC-PFO	684	100	98.00	98.00	
Swift Bypass	PFO	SBC-PFO	707	100	63.60	63.60	80.80
Swift Bypass	PSS	SBC-PSS	829	100	44.50	44.50	
Swift Canal	PSS	SBC-PSS	533	100	44.30	44.30	44.40
Swift Bypass	PUB	SBC-PUB	740	100	0.00	0.00	
Swift Bypass	PUB	SBC-PUB	NWS POND	100	0.00	0.00	
Swift Canal	PUB	SBC-PUB	581	100	0.00	0.00	
Swift Canal	PUB	SBC-PUB	603	100	0.00	0.00	0.00
Swift Bypass	RD	SBC-RD	813	100	100.00	100.00	
Swift Bypass	RD	SBC-RD	707b	100	97.90	97.90	
Swift Canal	RD	SBC-RD	519	100	94.40	94.40	
Swift Canal	RD	SBC-RD	557	100	100.00	100.00	
Swift Canal	RD	SBC-RD	762	100	80.60	80.60	94.58
Swift Bypass	RM	SBC-RM	750	100	96.50	96.50	96.50
Swift Canal	ROW	SBC-ROW	518	100	12.20	12.20	
Swift Canal	ROW	SBC-ROW	531	100	4.10	4.10	8.15
Swift Bypass	RS	SBC-RS	889	100	52.50	52.50	
Swift Canal	RS	SBC-RS	691	100	79.30	79.30	65.90
Swift Bypass	RUB	SBC-RUB	1	100	0.00	0.00	
Swift Bypass	RUB	SBC-RUB	2	100	0.00	0.00	
Swift Bypass	RUB	SBC-RUB	3	100	0.00	0.00	0.00
Swift Bypass	SH	SBC-SH	747	50	10.20	20.40	20.40
Swift Bypass	UD	SBC-UD	700	50	50.00	100.00	
Swift Canal	UD	SBC-UD	550	100	100.00	100.00	
Swift Canal	UD	SBC-UD	519A	100	97.30	97.30	99.10
Swift Canal	UM	SBC-UM	654	100	91.90	91.90	
Swift Canal	UM	SBC-UM	745	100	86.70	86.70	89.30
Swift	LUB	SW-LUB	S.L.	5	0.00	0.00	0.00
Swift	M	SW-M	323	100	95.70	95.70	
Swift	M	SW-M	341	100	98.90	98.90	
Swift	M	SW-M	552	100	94.20	94.20	
Swift	M	SW-M	1030	100	98.80	98.80	
Swift	M	SW-M	1076	100	100.00	100.00	97.52
Swift	MD	SW-MD	456	50	13.80	27.60	27.60
Swift	MS	SW-MS	111	100	100.00	100.00	
Swift	MS	SW-MS	180	100	82.00	82.00	
Swift	MS	SW-MS	392	100	100.00	100.00	

**Mink HEP Data**

Location	Habitat Type	SEGHAB	HEP Polygon #	Max Length of Transect	Sum of Tree/Shrub Length	Percent of Tree/Shrub Cover	Average SEGHAB Tree/Shrub Percent Cover
Swift	MS	SW-MS	415	100	98.40	98.40	
Swift	MS	SW-MS	1057	100	100.00	100.00	96.08
Swift	OG	SW-OG	28	100	100.00	100.00	
Swift	OG	SW-OG	66	100	95.70	95.70	
Swift	OG	SW-OG	340	100	97.00	97.00	
Swift	OG	SW-OG	1163	100	100.00	100.00	
Swift	OG	SW-OG	1165	100	100.00	100.00	
Swift	OG	SW-OG	1219	100	96.80	96.80	98.25
Swift	P	SW-P	94	100	94.30	94.30	
Swift	P	SW-P	167	100	97.90	97.90	
Swift	P	SW-P	214	100	100.00	100.00	
Swift	P	SW-P	248	100	99.30	99.30	
Swift	P	SW-P	377	100	95.90	95.90	
Swift	P	SW-P	1143	100	97.20	97.20	97.43
Swift	PEM	SW-PEM	223	60	13.30	22.17	22.17
Swift	PFO	SW-PFO	320	100	57.90	57.90	
Swift	PFO	SW-PFO	651	100	90.10	90.10	74.00
Swift	PSS	SW-PSS	70	100	67.60	67.60	67.60
Swift	PUB	SW-PUB	70	50	50.00	100.00	
Swift	PUB	SW-PUB	406	100	0.00	0.00	50.00
Swift	RD	SW-RD	369	100	100.00	100.00	
Swift	RD	SW-RD	843	100	100.00	100.00	
Swift	RD	SW-RD	1215	100	91.00	91.00	
Swift	RD	SW-RD	1242	100	100.00	100.00	97.75
Swift	RM	SW-RM	235	100	99.60	99.60	
Swift	RM	SW-RM	321	100	100.00	100.00	
Swift	RM	SW-RM	1106	100	100.00	100.00	99.87
Swift	RS	SW-RS	1303	100	51.70	51.70	51.70
Swift	SH	SW-SH	1340	100	32.90	32.90	32.90
Swift	SS	SW-SS	107	100	80.30	80.30	
Swift	SS	SW-SS	108	100	61.00	61.00	
Swift	SS	SW-SS	116	100	45.60	45.60	
Swift	SS	SW-SS	162	100	22.90	22.90	
Swift	SS	SW-SS	391	100	95.50	95.50	61.06
Swift	SSI	SW-SSI	82	100	8.90	8.90	
Swift	SSI	SW-SSI	324	100	0.10	0.10	4.50
Swift	UD	SW-UD	216	100	99.20	99.20	
Swift	UD	SW-UD	387	100	95.70	95.70	
Swift	UD	SW-UD	500	100	100.00	100.00	
Swift	UD	SW-UD	516	100	100.00	100.00	98.73
Swift	UM	SW-UM	78	100	85.70	85.70	
Swift	UM	SW-UM	410	100	100.00	100.00	
Swift	UM	SW-UM	433	100	88.80	88.80	
Swift	UM	SW-UM	435	100	100.00	100.00	
Swift	UM	SW-UM	1017	100	100.00	100.00	
Swift	UM	SW-UM	1071	50	47.10	94.20	94.78
Swift	YUD	SW-YUD	194	100	100.00	100.00	
Swift	YUD	SW-YUD	318	100	100.00	100.00	100.00
Yale N	AG	Y-AG	1916	100	0.00	0.00	
Yale N	AG	Y-AG	2807	100	16.00	16.00	8.00
Yale N	LP	Y-LP	412	100	43.90	43.90	
Yale N	LP	Y-LP	413	100	53.20	53.20	
Yale N	LP	Y-LP	731	100	45.20	45.20	47.43
Yale	LUB	Y-LUB	NORTH		0.00	0.00	
Yale	LUB	Y-LUB	SOUTH		0.00	0.00	0.00
Yale N	M	Y-M	595	100	100.00	100.00	
Yale N	M	Y-M	1482	100	96.60	96.60	
Yale S	M	Y-M	802	100	84.60	84.60	
Yale S	M	Y-M	3077	100	77.50	77.50	89.68
Yale N	MS	Y-MS	644	100	96.70	96.70	

**Mink HEP Data**

Location	Habitat Type	SEGHAB	HEP Polygon #	Max Length of Transect	Sum of Tree/Shrub Length	Percent of Tree/Shrub Cover	Average SEGHAB Tree/Shrub Percent Cover
Yale N	MS	Y-MS	1272	100	97.90	97.90	
Yale N	MS	Y-MS	1493	78	78.00	100.00	
Yale N	MS	Y-MS	1573	100	97.70	97.70	
Yale N	MS	Y-MS	1600	100	96.00	96.00	
Yale N	MS	Y-MS	1833	100	99.00	99.00	
Yale S	MS	Y-MS	1231	100	85.20	85.20	
Yale S	MS	Y-MS	2307	100	94.90	94.90	
Yale S	MS	Y-MS	3087	100	90.30	90.30	95.30
Yale N	OG	Y-OG	264	100	69.10	69.10	
Yale S	OG	Y-OG	770	100	94.00	94.00	
Yale S	OG	Y-OG	2418	100	94.80	94.80	85.97
Yale N	OR	Y-OR	2831	50	13.70	27.40	
Yale N	OR	Y-OR	2887	50	3.30	6.60	17.00
Yale N	P	Y-P	371	100	98.90	98.90	
Yale N	P	Y-P	2126	100	98.10	98.10	
Yale N	P	Y-P	2198	100	100.00	100.00	
Yale S	P	Y-P	1337	100	90.30	90.30	
Yale S	P	Y-P	1337b	100	100.00	100.00	97.46
Yale N	PEM	Y-PEM	662	50	50.00	100.00	
Yale N	PEM	Y-PEM	2546	100	7.70	7.70	
Yale S	PEM	Y-PEM	3131	100	0.00	0.00	35.90
Yale N	PFO	Y-PFO	573	100	50.00	50.00	
Yale N	PFO	Y-PFO	1858	100	64.00	64.00	
Yale S	PFO	Y-PFO	3130	100	36.90	36.90	
Yale S	PFO	Y-PFO	3142	100	88.40	88.40	
Yale S	PFO	Y-PFO	3130b	100	98.00	98.00	
Yale S	PFO	Y-PFO	UNK	100	88.10	88.10	70.90
Yale N	PSS	Y-PSS	639	100	0.00	0.00	
Yale N	PSS	Y-PSS	2414	100	50.00	50.00	25.00
Yale S	P-T	Y-P-T	3109	100	60.80	60.80	60.80
Yale N	PUB	Y-PUB	640	100	0.00	0.00	
Yale N	PUB	Y-PUB	CGP	116	0.00	0.00	
Yale S	PUB	Y-PUB	3116	100	0.00	0.00	
Yale S	PUB	Y-PUB	3117	60	0.00	0.00	
Yale S	PUB	Y-PUB	3118	28	0.00	0.00	
Yale S	PUB	Y-PUB	3116b	43	0.00	0.00	0.00
Yale N	RD	Y-RD	2268	100	100.00	100.00	100.00
Yale N	RM	Y-RM	697	100	83.50	83.50	
Yale N	RM	Y-RM	761	100	95.50	95.50	89.50
Yale N	ROW	Y-ROW	1044	100	4.20	4.20	
Yale N	ROW	Y-ROW	1458	100	12.40	12.40	8.30
Yale N	RS	Y-RS	2441	100	33.90	33.90	33.90
Yale N	SH	Y-SH	1565	100	100.00	100.00	
Yale N	SH	Y-SH	1587	50	50.00	100.00	100.00
Yale N	SS	Y-SS	515	100	13.30	13.30	
Yale N	SS	Y-SS	2440	100	37.80	37.80	
Yale S	SS	Y-SS	2014	100	28.10	28.10	26.40
Yale N	UD	Y-UD	875	100	100.00	100.00	
Yale S	UD	Y-UD	768	100	99.90	99.90	
Yale S	UD	Y-UD	989	100	95.80	95.80	
Yale S	UD	Y-UD	1365	100	93.40	93.40	
Yale S	UD	Y-UD	2627	100	93.80	93.80	
Yale S	UD	Y-UD	3235	100	98.70	98.70	
Yale S	UD	Y-UD	2627a	100	97.70	97.70	97.04
Yale N	UM	Y-UM	254	100	100.00	100.00	
Yale N	UM	Y-UM	2415	100	98.30	98.30	
Yale S	UM	Y-UM	1274	100	94.30	94.30	
Yale S	UM	Y-UM	2218	100	93.20	93.20	
Yale S	UM	Y-UM	3007	100	88.00	88.00	94.76
Yale N	YUD	Y-YUD	418	50	50.00	100.00	100.00

**Mink HEP Data**

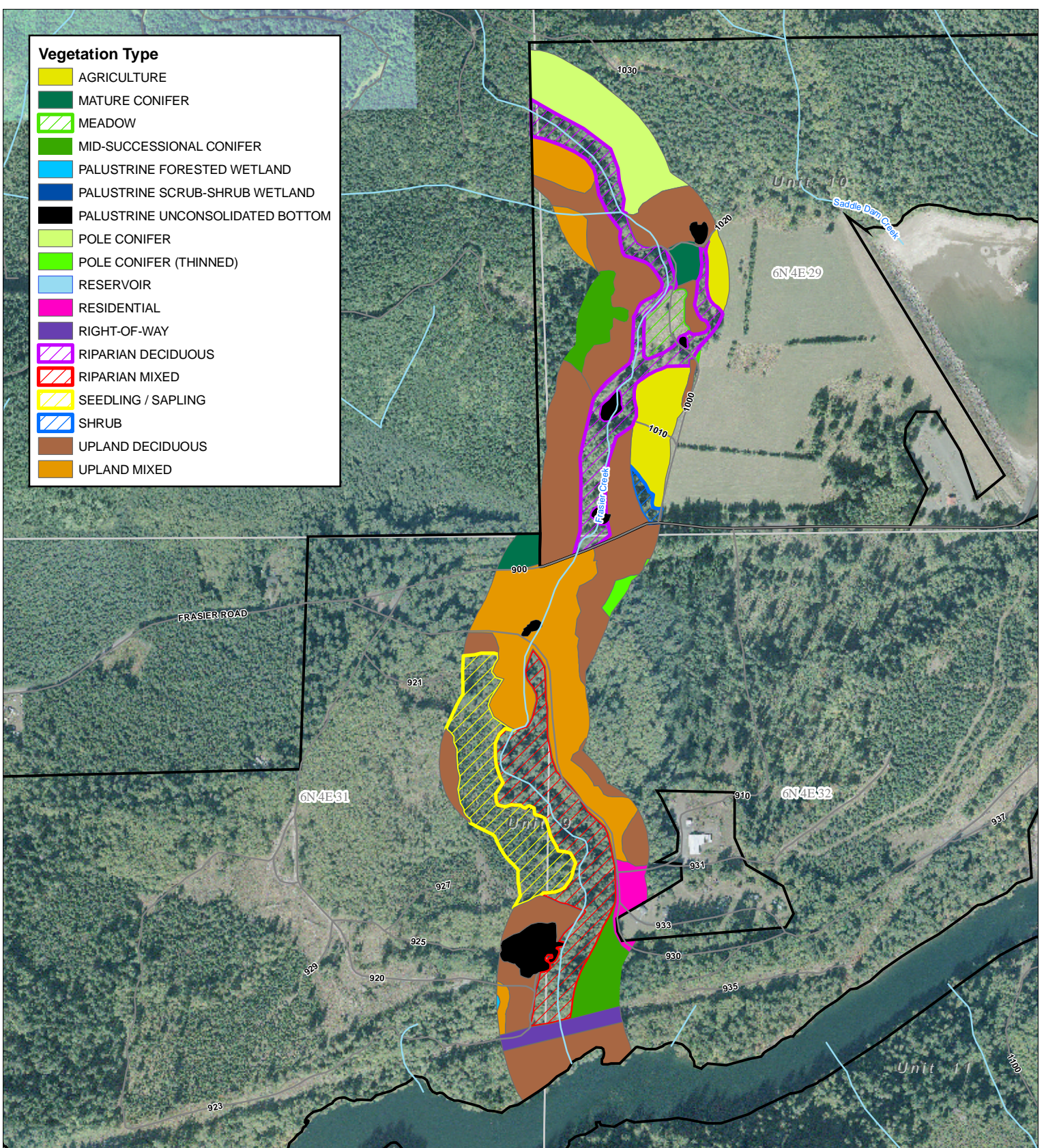
<b>Location</b>	<b>Habitat Type</b>	<b>SEGHAB</b>	<b>HEP Polygon #</b>	<b>Max Length of Transect</b>	<b>Sum of Tree/Shrub Length</b>	<b>Percent of Tree/Shrub Cover</b>	<b>Average SEGHAB Tree/Shrub Percent Cover</b>
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Only one percent cover average was determined for mink tree/shrub cover within 100m of water's edge (Mink HSI model variable SIV5) for each project segment area (Eagle Island, Merwin, Yale, Swift, Swift Canal). These average percent cover values were used to determine the overall HSI mink values for Lacustrine (Reservoir) (LUB), palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine forested (PFO), palustrine unconsolidated bottom (PUB), riverine (RUB) vegetation cover types within the project segment. This was completed by:

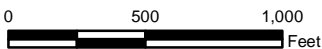
1. GIS was used to determine the acreage of each vegetation cover type within the 100 m buffer around all wetlands (PEM, PFO, PSS, PUB), river (RUB), and reservoir (LUB) in each project segment.
2. The acreages for each vegetation cover type were converted to percentages of the total buffer area in each project segment. For example, 12.5% OG 55.5% MS, 5% RD, 4% PFO, 3% PSS, 20% developed.
3. The combined tree/shrub cover from corresponding SEGHAB field data was used to determine each SEGHAB average percent tree/shrub cover
4. The SEGHAB average percent tree/shrub cover was then multiplied by the percentage of the respective cover type in the buffer areas.
5. These products were then summed to get a weighted average for tree/shrub cover in the buffer.
6. This sum was used to determine an overall HSI model SIV5 (tree/shrub cover within 100 m) for each reservoir analysis area

**Vegetation Type**

- AGRICULTURE
- MATURE CONIFER
- MEADOW
- MID-SUCCESSIONAL CONIFER
- PALUSTRINE FORESTED WETLAND
- PALUSTRINE SCRUB-SHRUB WETLAND
- PALUSTRINE UNCONSOLIDATED BOTTOM
- POLE CONIFER
- POLE CONIFER (THINNED)
- RESERVOIR
- RESIDENTIAL
- RIGHT-OF-WAY
- RIPARIAN DECIDUOUS
- RIPARIAN MIXED
- SEEDLING / SAPLING
- SHRUB
- UPLAND DECIDUOUS
- UPLAND MIXED



**Lewis River  
Vegetation Types within  
100m of Frasier Creek**



**Legend**

- Streams
- Roads
- Section
- Management Unit

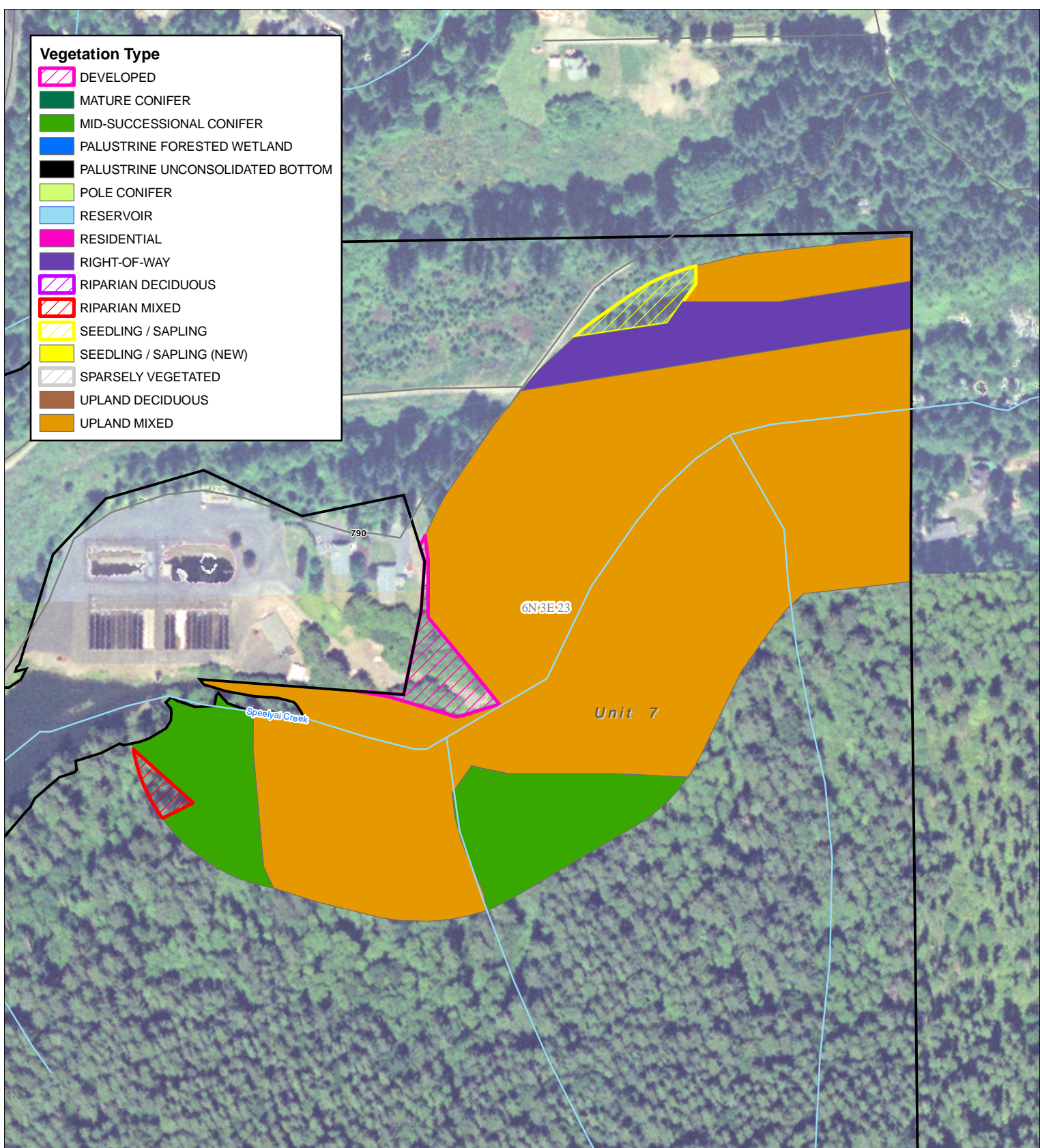


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Data are projected in UTM Zone 10, NAD83, meters.

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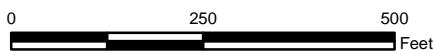


**Vegetation Type**





-  DEVELOPED
-  MATURE CONIFER
-  MID-SUCCESSIONAL CONIFER
-  PALUSTRINE FORESTED WETLAND
-  PALUSTRINE UNCONSOLIDATED BOTTOM
-  POLE CONIFER
-  RESERVOIR
-  RESIDENTIAL
-  RIGHT-OF-WAY
-  RIPARIAN DECIDUOUS
-  RIPARIAN MIXED
-  SEEDLING / SAPLING
-  SEEDLING / SAPLING (NEW)
-  SPARSELY VEGETATED
-  UPLAND DECIDUOUS
-  UPLAND MIXED

**Lewis River**  
Vegetation Types within  
100m of Speelyai Creek

Unit 7



**Legend**

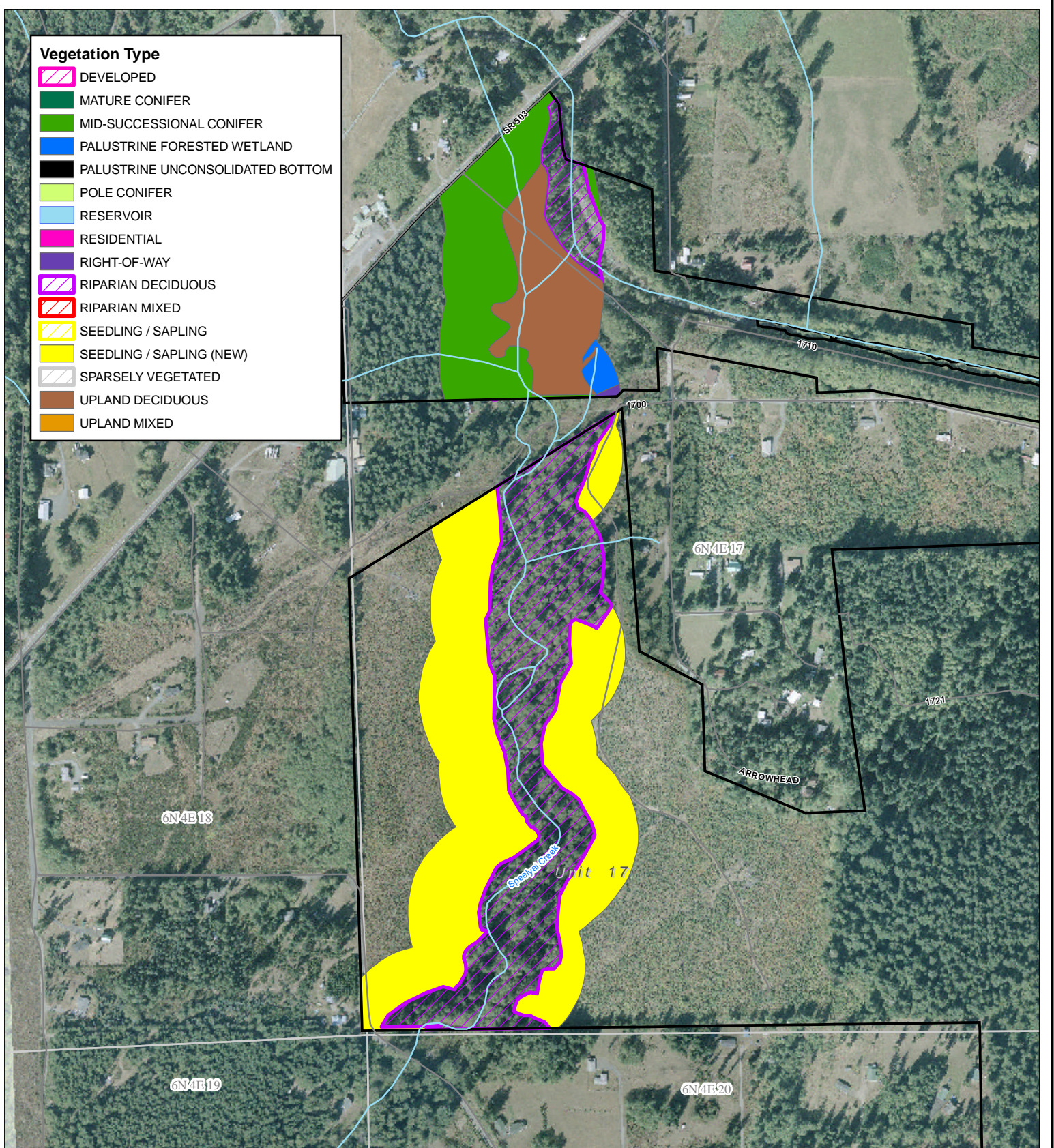
-  Streams
-  Roads
-  Section
-  Management Unit



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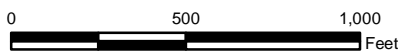
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**Vegetation Type**

- DEVELOPED
- MATURE CONIFER
- MID-SUCCESSIONAL CONIFER
- PALUSTRINE FORESTED WETLAND
- PALUSTRINE UNCONSOLIDATED BOTTOM
- POLE CONIFER
- RESERVOIR
- RESIDENTIAL
- RIGHT-OF-WAY
- RIPARIAN DECIDUOUS
- RIPARIAN MIXED
- SEEDLING / SAPLING
- SEEDLING / SAPLING (NEW)
- SPARSELY VEGETATED
- UPLAND DECIDUOUS
- UPLAND MIXED

**Lewis River**  
 Vegetation Types within  
 100m of Speelyai Creek  
 Unit 17



**Legend**

- Streams
- Roads
- Section
- Management Unit



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